

PATENT SPECIFICATION

1,123,358

NO DRAWINGS.

1,123,358



Date of Application and filing Complete Specification:
10 Oct., 1966. No. 45208/66.

Application made in Germany (No. F47392 IVc/39b) on
9 Oct., 1965.

Complete Specification Published: 14 Aug., 1968.

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Index at Acceptance:—C3 P(11A, 11C8B, 11C12B, 11C17, 11C20B, 11D5, 11K11); F2 A6A1.

Int. Cl.:—C 08 g 37/02.

COMPLETE SPECIFICATION.

Moulding Material Suitable for Making Sliding Elements.

We, FARBERWERKE HOECHST AKTIENGESELLSCHAFT, Vormalis Meister Lucius & Bruning, a Company recognized by German Law, of 6230 Frankfurt (M)-Hoechst, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to the manufacture of sliding elements, for example, bearing shells and bearing bushes and sliding guides made from a mixture of a polyacetal and a calcite and having an improved abrasion resistance.

The hitherto proposed bearings made from a polyacetal show good sliding properties, but they do not always meet the requirements made with regard to abrasion and service life. It has been proposed to improve the sliding properties of other thermoplastic materials by addition of molybdenum sulphide. Mixing molybdenum sulphide into a polyacetal, however, adversely affects the thermal stability of the material, thus rendering very difficult its perfect processing into shaped structures.

The present invention is based on the observation that sliding elements, for example, bearing shells, bearing bushes and sliding guides, having good sliding properties and an improved abrasion resistance can be manufactured from a mixture comprising a polyacetal having a melt index (i_2) at 190°C. within the range of 0.5 grams to 20 grams per 10 minutes, preferably 1 gram to 10 grams per 10 minutes and present in an amount within the range of 70 parts to 99.5 parts by weight, preferably 80 parts to 99 parts by weight, and a calcite, preferably chalk, in an amount within the range of 0.5 part to 30 parts by weight, preferably 1 part to 20 parts by weight. The

[Price 4s. 6d.]

good sliding properties of the polyacetal and the thermal stability are hardly affected by the incorporation of a calcite.

By the term "polyacetal" used herein there is meant a homopolymer of formaldehyde or trioxan or is a copolymer of trioxan, preferably containing units derived from a cyclic formal or a cyclic ether, for example, diethylene glycol formal, dioxolane, butanediol formal, ethylene oxide, oxacyclobutane or tetrahydrofuran in an amount of not more than 15% by weight. A copolymer of trioxan and ethylene oxide is particularly suitable.

One or more usual additives, for example, a stabilizer, a dyestuff, a pigment or a processing auxiliary may also be present in the mixture of the invention.

The efficiency of the calcite that is added to the polyacetal is, to a great extent, independent of its particle size, its origin (deposit) as well as of its working up or the process of its manufacture, as can be seen from the following table.

The polyacetal and the calcite can be mixed according to any known method. It is, however, preferably first to mix the two powders in a thorough manner in a mixer and then to process this mixture as such or in the form of granules. The sliding elements may be directly brought into the desired shape by injection moulding or structures shaped by press-moulding or extrusion may be further shaped by machining.

Sliding elements made from this mixture can be used in a wide range of applications without needing lubrication. They are therefore particularly appropriate for constructing plain bearings needing no attendance. As sliding partners are suitable a usual material, preferably, a metal, for example, a steel or a bronze.

In the following Example which illus-

WHAT WE CLAIM IS:—

1. A mixture for the manufacture of a bearing, an element thereof or a body having a sliding surface, which mixture comprises a polyacetal (as hereinbefore defined) having a melt index (i_2) at 190°C within the range of 0.5 gram to 20 grams per 10 minutes and present in an amount within the range of 70 parts to 99.5 parts by weight and a calcite in an amount within the range of 0.5 part to 30 parts by weight.
2. A mixture as claimed in claim 1, wherein the melt index (i_2) of the polyacetal lies within the range of 1 gram to 10 grams per 10 minutes.
3. A mixture as claimed in claim 1 or claim 2, wherein the amount of polyacetal present lies within the range of 80 parts to 99 parts by weight.
4. A mixture as claimed in any one of claims 1 to 3, wherein the amount of the calcite present lies within the range of 1 part to 20 parts by weight.
5. A mixture as claimed in any one of claims 1 to 4 wherein the polyacetal is a homopolymer of formaldehyde or trioxan.
6. A mixture as claimed in any one of claims 1 to 4, wherein the polyacetal is a copolymer of trioxan containing units derived from a cyclic formal or a cyclic ether in an amount of not more than 15% by weight.
7. A mixture as claimed in claim 6, wherein the cyclic formal is diethylene glycol formal or butanediol formal.
8. A mixture as claimed in claim 6, wherein the cyclic ether is dioxolane, tetrahydrofuran, oxacyclobutane or ethylene oxide.
9. A mixture as claimed in any one of claims 1 to 8, wherein the calcite is a chalk.
10. A mixture as claimed in any one of claims 1 to 8, wherein the calcite used is a calcite specified in the Table in the Example herein.
11. A mixture as claimed in any one of claims 1 to 10, containing a stabilizer, a dyestuff, a pigment or a processing auxiliary.
12. A mixture as claimed in claim 11, wherein the stabilizer used is 2,2'-methylene-bis-(4-methyl-6-tertiary-butyl-phenol).
13. A mixture as claimed in claim 11 or claim 12, wherein dicyano-diamide is used as stabilizer.
14. A mixture as claimed in claim 1, having any one of the compositions specified in the Example herein.
15. A process for the manufacture of a bearing, an element thereof or a body having a sliding surface, wherein the article is manufactured from a mixture claimed in any one of claims 1 to 13.
16. A process as claimed in claim 15, wherein the mixture is shaped by press-moulding or extrusion.
17. A process as claimed in claim 15, wherein the mixture is shaped by injection moulding.
18. A bearing, an element thereof, or a body having a sliding surface, manufactured according to a process claimed in any one of claims 15 to 17.
19. A bearing shell, a bearing bush or a sliding guide, manufactured according to a process claimed in any one of claims 15 to 17.

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Reference has been directed in pursuance of Section 9, subsection (1) of the Patents Act, 1949, to patent No. 912,121.